The Research and Application of the Electricity Information Collection System for Power Users

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Abstract: Right now, the use of electricity is very different from before, especially in different seasons. For better meeting people's electricity needs, electricity companies need to keep up with the trend of the times, make full use of modern advanced science and technology to construct electricity information collection systems, and apply them to power marketing, which not only greatly reduces the error of power consumption information, but also improves the accuracy. It is also able to provide electricity service in a targeted manner combied with the actual situation of users, and promote the further development of the electricity industry in China. Based on this, carry out the application of the electricity consumption information collection system in power marketing.

1. Introduction

In the 21st century, the industry that is closely related to the great national economic development, social development, social and economic reform, and people's living standards is the power industry. With the advancement of technology and the development of the times, the electricity industry has become an indispensable element in the development of every industry. China's demand for electricity is increasing, and it is gradually showing a rising trend. At the same time, government agencies across China have also integrated this strategic development with daily power grid construction. In China's current social development, the electricity consumption is increasing, the scale of the power grid is also expanding, the coverage area is becoming wider and wider, and the development trend is also developing in a diversified direction. This has also increased the difficulty of collecting electricity information of power users across the country. The electricity information collection system for power users strictly follows the relevant regulations of the electricity companies in China. They cover the business with energy calculation, smart meter reading, prepaid usage and so on, which is beneficial to users' timely understanding of their own power consumption information. The coverage and use of this intelligent electricity information collection system ensures the information exchange and interaction between the grid company and users.

2. Basic Overview of the Electricity Information Collection System

2.1. Concept.

The electricity information collection system mainly refers to the system for collecting electricity consumption information of power users, as shown in Figure 1. It can not only accurately collect the electricity consumption information of users, but also monitor and process the electricity consumption information of users in real time, which lays a good foundation for ladder pricing and load management in the later power marketing management, significantly improves the level of power marketing services, and better meets the requirements of people's electricity needs. Also, the effective application of the electricity information collection system has also facilitated the electricity companies to carry out meter reading, peak power consumption, which has significantly reduce the electricity costs. At present, electricity information collection system have been widely

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used in the electricity industry. The system is mainly composed of a main station layer, a data acquisition layer, and a collection point monitoring device layer.

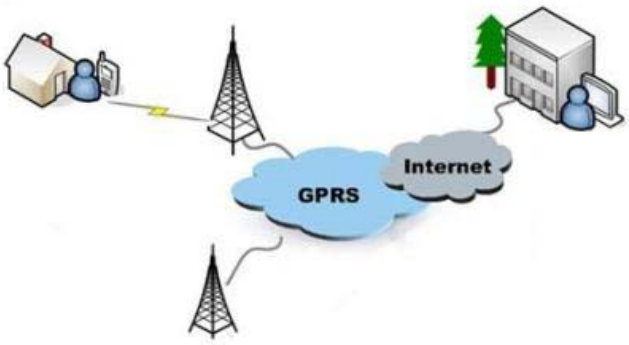

Figure 1. The Electricity Consumption Information Collection System

2.2. Function.

The functions of electricity information collection system include:

(1) Accurately collect electricity consumption data information, use the electric information collection system and combine the actual needs of different businesses to formulate corresponding data information collection tasks, and supervise and manage the task execution process.

(2) Power data management. Under the premise of effectively collecting user electricity information data, calculate and analyze the rationality of data and realize the storage and management of data information.

(3) Control of fixed value control. The system power and power rate setting control functions can be fully utilized by implementing the remote control of the system.

(4) Comprehensive application. Except automatic meter reading, power management, power anomaly inspection and other functions, it can manage and control the entire operation process, including system time setting and adjustment, authority password management, system operation monitoring, report management, etc. It can also effectively ensure the smooth connection between different kinds of business.

2.3. Features of the Electricity Information Collection System.

The electricity information collection system covers the entire power system and power users, and monitors the data information such as electricity, voltage, current and load in real time, so as to realize the coverage, collection and regulation of the whole network.

(1) Whole Network Coverage

The most important feature of the electricity information collection system is that it has realized the coverage of the whole network, which means it can regulate and manage all kinds of specialized users, industrial and commercial users, individual users, dedicated users and public distribution transformers, and the coverage rate has reached 100%. In addition, data collection can be realized for each hydroelectric power station, substation and thermal power station.

(2) Whole Network Collection

The system has realized the collection of all data information of power users, and exerts the regulation and management functions through various communication channels. The system needs to be connected with various terminal modules, such as the collection terminal module, the load monitoring module, the data collection module, etc.

3. Impact of Electricity Information Collection System on Power Marketing

3.1. Improve the Quality of Service in Power Marketing.

The use of electricity collection systems in power systems makes electricity companies more convenient and intelligent for the collection of user’s information. Through information means, you

can quickly understand the needs of users and provide them with scientific electricity plans to improve the quality of service in power marketing.

3.2. Improve the Level of Refinement of Power Management.

Establish a power consumption information collection system in power marketing can monitor the user's power consumption information at various time periods, and know their power consumption information in real time. In the meanwhile, it is possible to detect problems such as user power quality and abnormal power consumption through the use of electricity information collection system, and timely deal with the existing problems, thus making up for the shortcomings of previous power management. In addition, the staff can comprehensively grasp the various indicators and data of power marketing, which can reduce the work of them, and thus improve the level of power management, and ensure the smooth operation of the power system.

3.3. Innovate Power Marketing Management.

Establish electricity consumption information collection system in power marketing, change the original traditional power management mode, innovate power marketing management, and further improve the level of power marketing management. After the construction of the electricity collection information system, the original meter reading is removed, and the power information of the supply, purchase, and sale of electricity can be collected in real time, thereby transforming the power marketing from manual to fully automated closed management mode.

4. Application of Electricity Information Collection System on Power Marketing

4.1. Effectively Manage Line Damages and Realize Orderly Use of Electricity.

The traditional management of line loss takes lots of time and the process of calculating the line loss at different times, It is also easy to have errors, which will lead to the failure of the line loss accuracy, and the staff can not reflect the true situation of the clues. By using the electricity information collection system, the information of the line loss management in a certain period of time can be frozen, and the meter reading can be automated, so that all the information can be at the same time to prevent errors in different time periods. Also, the work efficiency will be higher and the analysis of line loss will be time sensitive.

4.2. Automated Meter Reading and Settlement.

Right now, manual meter reading is still used by the electricity companies in most regions. Meter reading staff need to spend a lot of time going for door to door meter reading, and work efficiency is not high. And need to paste the form on the meter, if lost, it will affect the electricity bill recovery of the electricity company. User's various power consumption information can be effectively collected by applying the electricity information collection system, which can not only divide the time period, but also automatically settle, so that the timeliness and accuracy of the electricity accounting will be guaranteed. Send meter reading forms to users through SMS and other diversified methods, not only guarantee the timeliness, but also avoid problems such as information loss.

4.3. Prepaid Control.

Constructing a electricity information collection system is also very helpful for prepaid control. The types of users in electricity companies are various, and there are great differences in the using situations of different users. Then, in the combination with the difference in customer types, different meter reading methods and meter reading cycles can be used for the more effective management of power users, and the stable operation of the company will be guaranteed. For example, for some users, they have a large amount of electricity consumption, so the meter reading cycle can be shortened appropriately, and the frequency of electricity charges can be appropriately increased, so as to fully exert the role of supervision.

4.4. Orderly Use of Electricity.

The survey has found that electricity consumption suddenly increased in some special time periods, which increased the pressure on the stable operation of the power system. Some electricity companies fail to accurately predict market power demand because they do not care about basic data information, and cannot develop target operating systems. In view of this kind of situation, through the construction of the electric information collection system, the power user's electricity consumption information can be collected more effectively, so that the corresponding electricity consumption system can be formulated according to the using situation. The market power demand can be accurately judged, and the power system operating pressure can be maximized reduced. In the meanwhile, according to the collected electricity consumption data, the electricity companies can also formulate specific measures to achieve the purpose of reducing power load.

5. Conclusion

Under the background of increasing domestic and international demand for electricity, electricity also companies need to increase their exploration and control of power consumption. This paper combines the development status at home and abroad, and the current research progress of the electricity information collection system for power users, deeply studies the functions that can be realized by the electricity information collection system, and the practical significance brought to the production and life. On one hand, the electricity information collection system can monitor the user's power consumption in real time and accurately record the their electricity consumption data. When the electricity company collects the fee, the system can provide a series of certificates, which can avoid the dispute between the collectors and customers. In general, in the electricity system of China, strengthening the inspection and monitoring of the user's electricity consumption plays an important role in maintaining the safety of the electricity system. So, in the power marketing, strengthen the analysis of the energy consumption fee, and perform long-distance meter reading, management of power fee and power analysis, thereby strengthening the management of the user's electricity consumption.

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